H AND WHEN TO COLLECT WHITE PINE SEED

his and next year's crop of cones. Large ones mature and ready for picking.

By F. W. RANE

ASSACHUSETTS STATE FORESTER
Room 7, State House
BOSTON, MASS., - - U. S. A.

The Staminate (male) and Pistillate (female) flowers of the White Pine. These appear a year before the cones develop; hence it is an easy matter to determine a year in advance of a seed crop.

HOW AND WHEN TO COLLECT **WHITE PINE SEED**

THE white pine (*Pinus Strobus*) is one of the most common trees found in Massachusetts and New England, and is of great economic and æsthetic value, yet the writer finds that little is known about its method of propagation.

Even teachers and those who have studied botany and nature study, and again farmers and men who have worked in the woods or at the lumber industry all their lives, seem never to have given the matter any thought or definite observation.

White pine is grown from seed only; it does not sprout from the roots when cut, as our hard woods. In replanting our waste and abandoned lands with white pine, the first step is to collect the seed. Some evidently think pine trees come from nothing, or were

White pine from seed only

created, perhaps, but this is not the way Nature does things. If we expect an agricultural crop, the kind of grain desired is planted; just so with growing the white pine.

Pine seed comes from the cones which grow upon the pine trees. The cones are more abundant upon trees of twenty years of age or more, and are located near the top of the tree. Old single pasture pines, or those growing in clumps or along the edges of the forest, and more or less limbed, commonly called "cabbage pines," are usually the greater seed bearers. These trees, also, are the easier to collect the cones from.

Seed comes from pine cones

It requires two seasons for the white pine cones to mature. The embryo cone, which is the pistillate (female) blossom of the pine, forms in the spring of the year, at which time it is fertilized, and can be seen throughout that whole season as a small, upright,

Two seasons for seeds to mature

so-called "Christmas candle," an inch or so long. When vegetation starts the second season, however, the white pine cone takes on activity, and by August it reaches full size, which varies from four to six inches in length. During this time the seeds form at the base and under the scales. The cones remain green until the latter part of August or fore part of September, depending upon the nature of the season, when they mature and turn brown. When mature, the cones, while still hanging on the tree, open up (spread out their scales) at the first dry period, thus allowing the seeds which have been concealed to drop out. Each pine seed is provided with a delicate wing, in some respects resembling the wing of a bee, and this assists the seed very much in its distribution. With scarcely any wind the seeds travel for some distance before they reach the ground, so with a strong gale at time of

Seed scattered by wings

shedding, one can imagine how far they may be distributed. The finding of isolated pine seedlings is often accounted for in this way. The prevailing wind at time the cones are opening governs the territory seeded.

If we desire to collect white pine seed, it is important that the cones be collected before they open and lose their seed. This may be done in the latter part of the month of August, any time before the cones open.

Collect cones before they open

There are various methods of collecting the cones, but the best advice is to get them somehow. Picking with a long ladder is one way; another, and one that will recommend itself, is to find out where lumbering is going on, and collect the cones as they fell the trees.

Methods of collecting cones

When connected with the New Hampshire College the writer tried a number of

ways of solving this problem. One which worked very nicely was to send about four or five boys up the trees to pick the cones and throw them over the branches to the ground, while another one remained upon the ground and gathered them into bags. The cones may again be gathered by picking and putting directly in a bag which is attached to the shoulder, similar to the manner of picking apples. Old gluten or feed bags, inexpensive and commonly available about farmers' barns, answer very well for this purpose.

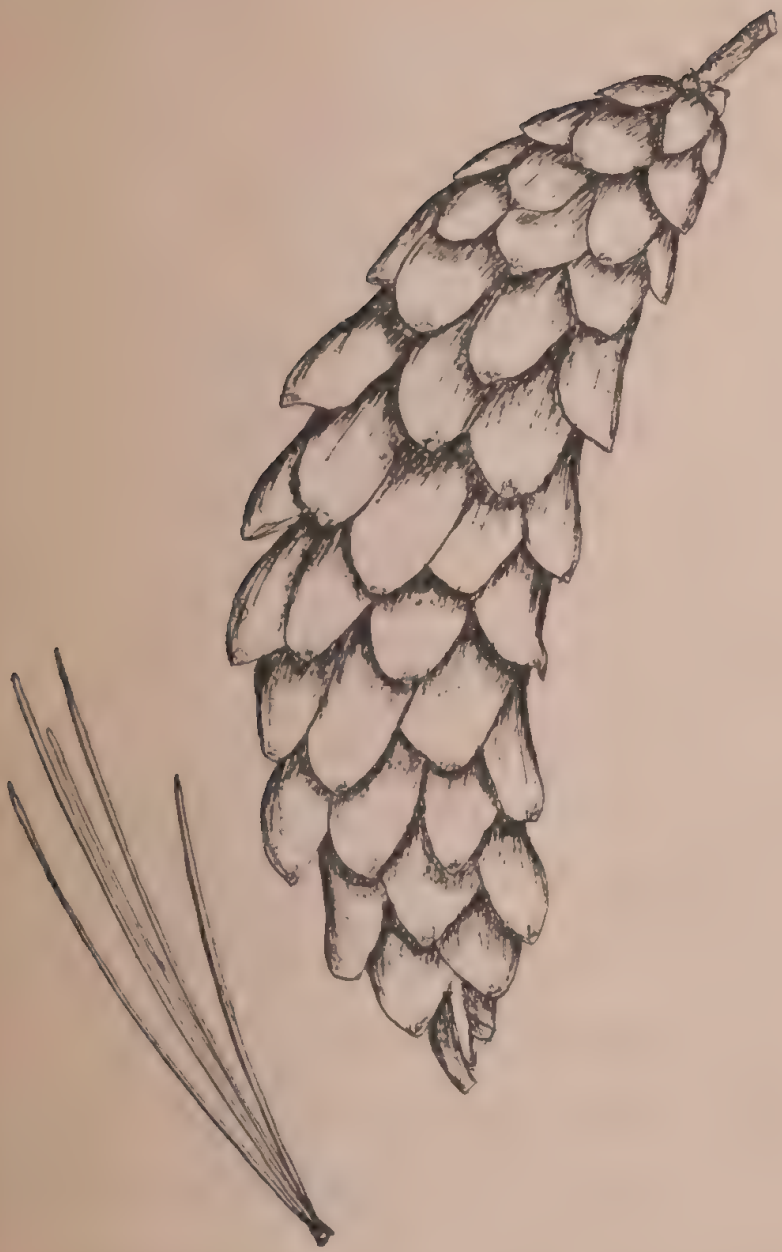
Mother seed trees

The number or quantity of cones that can be gathered in a day will vary as to the yield per tree, method of gathering, etc. As white pine box-boards throughout New England are in great demand, and at a relatively high price, even the old "cabbage pines," full of limbs, a few years ago considered valueless, are at present rapidly going to the

sawmill. These old trees in the past have been the great seed producers and mother trees of our present forest stands. If they are destroyed, however, where must we look for our future pines?

An example in collecting pine seed

One man, with two assistants, in a seed year spent nearly two days in cutting down about 50 pine trees and picking the cones from them, and gathered two wagon loads, some 50 bushels before the cones were open. When they were dried out and opened, he had fully 100 bushels of cones and nearly 5 bushels of uncleaned seed. His method of drying was to spread them out where the sun could shine on them, raking the pile over often, covering them with a canvas at night and in rainy weather. If the cones get wet they close up. It took in this case two weeks to get the seeds from the cones.



White pine cone with scales open and seed gone.
White pine needles grow in clusters of five.

After the cones are gathered it is n necessary that the seed be secured fro them at once. They may Securing seed from cones deposited in any dry place, whe squirrels or mice are kept fro them, and the seed thrashed o later. The practice of using a bag to p the cones in is convenient, for as they op up the bag can be flailed at odd times a the seed falls out into the bottom and readily collected.

Should one have a greenhouse, it is us ally available about the time the cones a ripe, and if they are placed here for a sh time, avoiding any moisture for a few da the high temperature will open the co very quickly. The writer has made it practice simply to place the bags in t greenhouse, and then turn and flail them oc sionally, when the seed is easily separat A hotbed or cold-frame sash could be ma to serve the same purpose on a small sc

here are probably many other ingenious ays of extracting the seed from the cones at will occur to different ones which will equally good.

White pine seed has averaged in price in cent years from $1.50 to $4.50 a pound. During the spring of 1907 the price in large quantities was $3.75 a pound.

ice seed

White pine seed if given normal conditions, not too moist or excessively dry, retains its vitality for several years. The reason that the seed has been so high is that the demand has increased very rapidly in this untry lately, and the few dealers have actically made their own prices.

tality ained years

It is hoped that this brief pamphlet will ist in calling attention to the importance of gathering white pine seed each year, when it is fruiting. We should ultimately consider the im-

portant collect d

portance of harvesting this crop, just t
same as any other.

The writer would consider it a gre
benefit to New England, and Massachuse

Pine seed campaign

in particular, if enough peo
could be interested so that a reg
lar pine seed campaign could
kept up until the seeds of this most inp
tant forest tree could be purchased at
cents a pound, and it is believed it can
done.

With pine and other forest tree seeds
plenty, at reasonable prices, people genera

Beginnings of forestry

will begin to start small nurse
beds in their gardens and fiel
which will in turn give us see
lings and transplants at a mu
more rational forestry basis than they c
be obtained at present.

There are from 20,000 to 30,000 wh
pine seeds in a pound, and it is customary f
nurserymen to plant this amount upon a b

feet wide and 50 feet long. Under nor-
al conditions, which will be described in
a forthcoming circular, a person
-30,000 ought to raise 10,000 to 15,000
eds in
pound seedlings on this area. With
the above data, and knowing the
stance apart that pines are set, usually
by 6 feet, one can figure out for himself
e cost of growing his own stock of plants.
It has been the endeavor of the writer to
ll in a precise and practical way just how
and when to collect the white
:clothing
.ste pine seed. It now remains to be
ıds seen how many we can get to do
something in this line. All per-
ns interested in reclothing our waste lands,
d in establishing economic and æsthetic
restry conditions throughout this Common-
ealth and New England, will find that
actising and impressing the simple begin-
ıgs of forestry on others will go far toward
ultimate solution.

Expensive forestry seeds and seedlin are the greatest drawbacks at the pres time to beginning forestry wo Let us remedy it. There a few seedsmen who handle for tree seeds, and the comparativ little demand until now has made the bu ness an uncertain one, and hence the pri are high.

Reason for high prices

If white pine sells for even $2 a pou no one cares to sow broadcast five pou per acre, as is recommended by so seedsmen, as the expense makes the ope tion anything but practical. No one ca to use five or ten dollars' worth of seed land that is in itself almost valueless. C lecting the seed one's self, however, obvia this difficulty and makes the conditions mo favorable.

There is much inquiry as to how oft white pine produces seed. Somehow t idea is quite firmly established

Seed year

e minds of many that a seed year once seven is a fixed law. From observation ere seems to be no definite regularity in ature. A white pine, like other trees, if yields a maximum crop one year, is not ely to produce another heavy crop in from ee to seven, depending upon the seasons d other conditions. The writer has seen o heavy crops in one locality only four ars apart. Examples are not uncommon, o, where a pine tree may be fruiting a number of cones and at the same time ve embryo cones which are to fruit the owing season.

Not all sections of the State are likely to d the same year, although they may. inquiry it is found that one section may ve a heavy crop, while another may have ne. In this way seed usually can be had m some section each year.

The seeds of spruce, hemlock, and other rgreens are collected in like manner as

Seed of other evergreens

the pine. Of course, they va in size of cone and seed a time of maturity.

Deciduous trees, or hard woods, are a easily grown from seed, and when one g

Hardwoods from seed

interested in collecting and gro ing the white pine, it is only step toward later interest a pleasure in the whole forestry question.

We need to cultivate as a people a gre love for out-of-door life, and there is not

Forests and Nature

ing that awakens interest and love for Nature herself more th the forests and their associatio

At a later time a companion booklet methods of planting and caring for seedlin will be issued.

F. W. RANE,

State Forester

State House, Boston, Mass.,
August 1, 1907